U7478

Reg. No.: ……..

Name:……...

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

CHEMISTRY

UK1DSCCHE100 - INORGANIC CHEMISTRY I

Academic Level: 100-199

Time: 1½ Hours **Max.Marks:42**

Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand)
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Write down the Schrodinger equation and explain the terms involved.	Remember	CO-1
2.	Predict the geometry associated with a molecule having two bond pairs and two lone pairs?	Remember	CO-2,3
3.	Write any two gases responsible for the greenhouse effect?	Understand	CO-4,5
4.	Name a metallochromic indicator used in complexometric titrations involving EDTA.	Understand	CO-6,7
5.	During the redox reaction between ferrous sulphate and potassium dichromate in acidic medium, which ion undergo reduction?	Understand	CO-6,7
6.	The dipole moment of CS_2 is zero, despite the polarity of C=S bond. Why?	Understand	CO-2,3

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply)
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	An orbital can accommodate a maximum of two electrons. State and explain the principle behind this statement	Understand	CO-1
8.	The bond angle in H_2O molecule is less than the tetrahedral angle. Why?	Understand	CO-2,3
9.	Explain how synthetic resins can be applied for waste water treatment.	Apply	CO-4,5
10.	2L of 6M HCl solution is added to 4L of water. What is the molarity of the resulting solution?	Apply	CO-6,7

Part C.
Answer all 4 Questions, choosing among options within each question.
Long Answer. 7 marks each. (Cognitive Level: Understand/Apply/Analyze)
28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	a. Using Slater's rule, how will you calculate the effective nuclear charge of atoms and ions. OR b. What is the de Broglie Equation? What is the relation between de Broglie Equation and Bohr's hypothesis of atom?	Understand	CO-1
12.	a. Apply the concept of hydrogen bonding to explain why water has a higher boiling point than hydrogen sulfide. OR b. What is Lattice energy. Apply in details the Born-Haber cycle for experimental determination of lattice energy.	Apply	CO-2,3
13.	a. Analyze the long-term effects of air pollution on human health and the environment. How can this knowledge influence policy decisions? OR b. Analyze the contributions of greenhouse gases to global warming and the effects it has on our environment.	Analyze	CO-4,5
14.	a. Analyze the principles and applications of complexometric titration, highlighting the role of EDTA and factors affecting the titration process. OR b. Design an experimental setup for a redox titration of Fe^{2+} with $KMnO_4$. Explain your approach.	Analyze	CO-6,7